WHAT IS CLAIMED IS:

1. A packet transmission apparatus comprising:

a plurality of queues;

packet transmitting means for extracting a packet from any one of said

5   plurality of queues and transmitting the extracted packet;

a classifying device for transferring an input packet to any one of said

plurality of queues in accordance with a priority of said input packet;

packet receiving means for receiving a packet that has arrived; and

transferring means for, as to said packet received by said packet receiving

10   means, omitting a classification made by said classifying device in a non-

congestion state and transferring the packet received by said packet receiving

means to said classifying device in a congestion state.

2. A packet transmission apparatus comprising:

a plurality of queues;

15   packet transmitting means for extracting a packet from any one of said

plurality of queues and transmitting the extracted packet;

a classifying device for transferring an input packet to any one of said

plurality of queues in accordance with a priority of said input packet;

packet receiving means for receiving a packet that has arrived; and

20   transferring means for alternatively transferring the packet received by said

packet receiving means directly to any one of said plurality of queues in a non-

congestion state and transferring said packet received by said packet receiving

means to said classifying device in a congestion state.

3. The packet transmission apparatus as set forth in claim 2, wherein said

25   packet transmitting means includes means for referring to said priority of each of

said plurality of queues and for transmitting a packet from a queue having a higher priority.

4. The packet transmission apparatus as set forth in claim 2, wherein said transferring means includes means for transferring said packet received by said packet receiving means directly to a queue having the highest priority among said plurality of queues in said non-congestion state.

5. The packet transmission apparatus as set forth in claim 2, wherein a step proceeds to processing of said congestion state when a queue length of a queue having the highest priority among said plurality of queues is at least a fixed threshold value.

6. The packet transmission apparatus as set forth in claim 2, wherein the priority of each of said plurality of queues is regularly constant, and a step proceeds to processing of said non-congestion state when all of said plurality of queues are empty.

7. The packet transmission apparatus as set forth in claim 2, wherein a priority of a queue having a highest priority prior to being switched among a plurality of queues is switched to a lowest priority when an entire length of all of said plurality of queues does not exceed a fixed threshold, and, when all queues except the queue having the lowest priority are empty in this state, a step proceeds to processing of said non-congestion state.

8. The packet transmission apparatus as set forth in claim 7, wherein a priority of each of said plurality of queues is returned to a state prior to being switched when a shift is carried out from said congestion state to said non-congestion state.

9. The packet transmission apparatus as set forth in claim 7, wherein, in a state where a priority of each of said plurality of queues has been switched, said

transferring means transfers the packet received by said packet receiving means directly to said queue having said lowest priority among said plurality of queues.

10. A packet transmitting method for receiving and transmitting an arrived packet comprising:

establishing at least first and second queues;

determining a congestion state;

classifying a priority of said arrived packet when said congestion state exists;

transferring said arrived packet to a one of said first and second queues based on said priority; and

omitting the step of classifying when said congestion state does not exist.

11. A packet transmitting method according to claim 10, further comprising transferring said arrived packet directly into a one of said first and second queues when said congestion state does not exist.

12. The packet transmitting method as set forth in claim 11, further comprising:

referring to a priority of said at least first and second queues to determine a higher priority queue; and

transmitting packets from said higher priority queue.

13. The packet transmitting method as set forth in claim 11, wherein, in a non-congestion state, directly transferring a received packet to a queue having a highest priority among said at least first and second of queues.

14. The packet transmitting method as set forth in claim 11, wherein the step of determining a congestion state includes determining when a queue length of a queue having a highest priority among said at least first and second queues contains at least a fixed threshold of packets.

15. The packet transmitting method as set forth in claim 11, wherein the step of determining a congestion state determines a non-congestion state when all of said at least first and second queues are empty.

16. The packet transmitting method as set forth in claim 11, further comprising:

switching a priority of a queue having a highest priority prior to being switched to a lowest priority when an entire length of all of said at least first and second of queues does not exceed a fixed threshold, and, when all queues except said queue having said lowest priority are empty in this state, the step of determining a congestion state determines a non-congestion state.

17. The packet transmitting method as set forth in claim 16, wherein a priority of each of said at least first and second queues is returned to a state that existed before being switched when the step of determining a congestion state determines the existence of a non-congestion state.

18. The packet transmitting method as set forth in claim 16, wherein in a state where a priority of each of said at least first and second queues has been switched, transferring a received packet directly to said queue having said lowest priority among said plurality of queues.